PCT

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PATENT
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Haruhisa SAITOH et al.

Application No.: 10/516,076 — Group Art Unit: *Unassigned*

Filed: November 29, 2004 — Examiner: *Unassigned*

For: FLUORESCENCE LIFETIME DISTRIBUTION IMAGE MEASUREMENT DEVICE AND MEASUREMENT THEREOF)

Commissioner for Patents
U.S. Patent and Trademark Office
2011 South Clark Place
Customer Window
Crystal Plaza Two, Lobby, Room 1B03
Arlington, VA 22202

Sir:

SUBMISSION OF INTERNATIONAL PRELIMINARY EXAMINATION REPORT

A translation of an International Preliminary Examination Report ("IPER") issued in corresponding PCT/JP2003/006702 is attached. Applicants respectfully request that the Examiner consider the IPER as it relates to the above-identified application

Respectfully submitted,

MORGAN, LEWIS & BOCKIUS LLP

Dated: January 12, 2005

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PCT Application
PCT/JP2003/006702

Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference FP03-0065-00	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/JP2003/006702	International filing date (*day/month/year*) 28 May 2003 (28.05.2003)	Priority date (*day/month/year*) 29 May 2002 (29.05.2002)
International Patent Classification (IPC) or national classification and IPC G01N 21/64		
Applicant	HAMAMATSU PHOTONICS K.K.	

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of _____ sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

Date of submission of the demand 28 May 2003 (28.05.2003)	Date of completion of this report 05 December 2003 (05.12.2003)
Name and mailing address of the IPEA/JP Facsimile No.	Authorized officer Telephone No.

Form PCT/IPEA/409 (cover sheet) (July 1998)

International application No.
PCT/JP2003/006702

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

I. Basis of the report

1. With regard to the elements of the international application:*

☒ the international application as originally filed

☐ the description:

pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

☐ the claims:

pages _____, as originally filed
pages _____, as amended (together with any statement under Article 19
pages _____, filed with the demand
pages _____, filed with the letter of _____

☐ the drawings:

pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

☐ the sequence listing part of the description:

pages _____, as originally filed
pages _____, filed with the demand
pages _____, filed with the letter of _____

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language _____ which is:

☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of the translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

☐ the description, pages _____
☐ the claims, Nos. _____
☐ the drawings, sheets/fig _____

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* *Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rule 70.16 and 70.17)*

** *Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.*

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International Application No.
PCT/JP03/06702

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims	1-6	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-6	NO
Industrial applicability (IA)	Claims	1-6	YES
	Claims		NO

2. Citations and explanations

Document 1: JP, 2002-39943, A (Japan Science and Technology Corp.), 6 February, 2002 (06.02.02)
Document 2: Time-gated Fluorescence Lifetime Imaging and Microvolume Spectroscopy Using Two-photon Excitation, (J. Sytsma, et al.), Journal of Microscopy, July 1998, Vol. 191, pages 39-51
Document 3: JP, 2-268254, A (Hamamatsu Photonics K.K.), 1 November, 1990 (01.11.90)
Document 4: Two-dimensional Visualization of Fluorescence Lifetimes by Use of a Picosecond Laser and a Streak Camera, (Federik Ossler et al.), Applied Optics, 20 April, 1998 (20.04.98), Vol. 37, No. 12, pages 2303-2314
Document 5: JP, 11-118716, A (Nikon Corp.), 30 April, 1999 (30.04.99)
Document 6: JP, 2000-88751, A (Olympus Optical Co., Ltd.), 31 March, 2000 (31.03.00)
Document 7: JP, 2001-356272, A (Olympus Optical Co., Ltd.), 26 December, 2001 (26.12.01)

The subject matters of claims 1-6 do not appear to involve an inventive step in view of documents 1-7 cited in the ISR.

Claim 1

Document 1 describes a multi-photon excitation fluorescence lifetime imaging system having (1) an ultra-short pulse laser light-source to generate multi-photon excitation, (2) a scanning means of performing laser scanning, (3) an optical isolating means of separating laser light and measured light, (4) an optical object system to irradiate laser light on a sample, (5) a time-resolved fluorescence detection means of measuring fluorescence lifetime and (6) a fluorescence lifetime imaging means of imaging the fluorescence lifetime of a sample.

Similar technologies have been well known as described in document 2.

On the other hand, in the technical field of fluorescence lifetime imaging, using a streak camera as a means of time-resolved fluorescence detection is well known as described in documents 3 and 4.

All of the inventions of documents 1 and 2, and those of documents 3 and 4, belong to the technical field of fluorescence lifetime imaging, and so a person skilled in the art could have easily used a well-known streak camera as a means of time-resolved fluorescence detection in the inventions described in documents 1 and 2.

It is not considered that a unique feature of the present application wherein a light separation means is disposed between a first scanning means and a second scanning means produces a significant action or effect, and it is a mere matter of design variation.

Accordingly, a person skilled in the art could have easily conceived of the subject matter of claim 1 from the inventions described in documents 1-4.

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Supplemental Box
(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of : V. 2

Claims 2 and 3

Document 1 describes a pulse laser using pulses on the order of femto-seconds (fs), and a person skilled in the art could have easily selected pulse widths of 150 fs or less.

A person skilled in the art could have naturally excited samples at power densities high enough to produce fluorescence, and chosen power densities of 105 W/cm^2 or more as required.

In addition, a person skilled in the art could have naturally chosen the range between λ and 2λ for laser wavelengths for two-photon excitation in view of the principles of two-photon excitation, and could have chosen the range of 750-1000 nm as optimum wavelengths, as required, according to the target sample.

Accordingly, a person skilled in the art could have easily conceived of the subject matters of claims 2 and 3 in view of documents 1-4.

Claim 4

A technology of adjusting the focus of an object lens by moving it upward/downward is well known as described in document 5 or 6.

Accordingly, a person skilled in the art could have easily conceived of the subject matter of claim 4 in view of the inventions described in documents 1-6.

Claim 5

The use of galvanometer mirrors as a means of laser-light scanning and that of dichroic mirrors as an optical isolating means are both well known, as described in documents 2 and 7.

Accordingly, a person skilled in the art could have easily conceived of the subject matter of claim 5 in view of the inventions described in documents 1-4 and 7.

Claim 6

For the same reasons as discussed above, a person skilled in the art could have easily conceived of the subject matter of claim 6 in view of the inventions described in documents 1-6.